

Notes

Project02 due

Finals Review on Wednesday

- Quizzes and Midterm are best study guides
- And homeworks

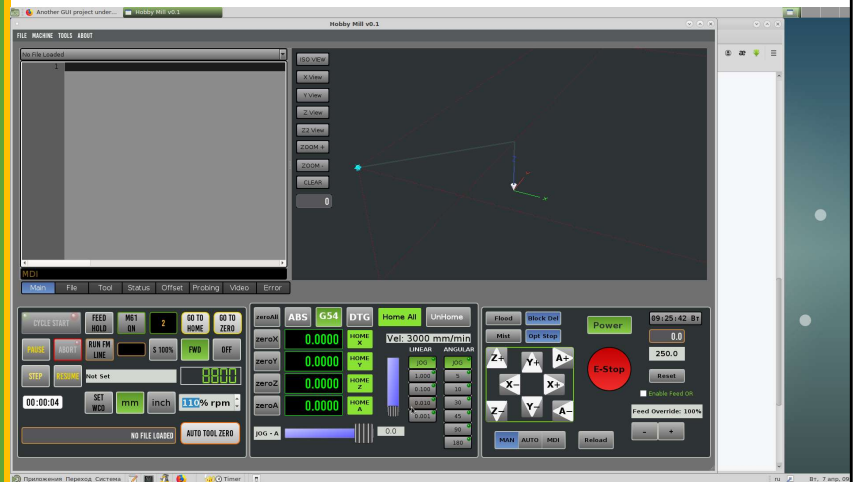
Final is Monday Dec 12th. Be sure you know time & place

CS112 – Java Programming

Fall 2022

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More Graphics



Last Time

We introduced the basics of Java Graphics programming

- Swing library
- Multithreading
- Events
- `JFrame`, `JPanel`, `JButton`, `JTextField`, `Timer`, `Color`

Final may have questions on `JPanel`, `JButton`, `Timer`, `Events`, and `Color`



More Graphics
topics

NOT ON THE FINAL

You could rush out, but

- These should be fun, useful, interesting
- We will spend the lab time working on the homework...and project for those who have not finished yet

Layout Managers

Help with positioning subcomponents within a JPanel

- Multiple layout managers:
 - BorderLayout: top, bottom, left, right, center regions. Place components in one of these
 - BoxLayout: subcomponents in one column or row. Nest JPanels with different orientations
 - FlowLayout: subcomponents placed left-to-right, top-to-bottom, based on sizes
 - GridLayout: user specifies number of rows and columns of subcomponents
 - etc

Return to our program: Graphics2.java
Add BorderLayout and show options

Pop-up Windows

Inform user of important information: errors, failures, results complete, etc

Swing has several useful classes – here is one: `JOptionPane`

```
JOptionPane.showMessageDialog(jFrame, "The Message");  
JOptionPane.showInputDialog(jFrame, "Message Prompt");  
JOptionPane.showOptionDialog(jFrame, "MessagePrompt");
```

Just show message & wait for user to press OK button

Prompt user to enter text, return the text

Prompt user to click YES or NO, return result as 0 or 1

More Events

Events

So far we have looked at "ActionEvents"

- Raised by many Swing components when they are exercised

Other lower-level events

- **Mouse events:** implements `MouseListener`
 - `mousePressed()`, `mouseReleased()`, `mouseClicked()`, `mouseEntered()`, `mouseExited()`
- **Keyboard events:** implements `KeyListener`
 - `keyTyped()`, `keyPressed()`, `keyReleased()`
- **Window events:** implements `ComponentListener`
 - `componentHidden()`, `componentShown()`, `componentMoved()`, `componentResized()`

Need to define a derived class to add all these functions! SHOW AND RUN Events.java

`mouseClick` = press and release in the same place

`componentShown` & `Hidden` are kind of weird

`componentMoved` also weird: only if component moved with respect to its parent. Don't need to handle this one

`componentResized` is the useful one: might have to adjust how window contents are displayed (e.g. Mandelbrot)



Still time?

Text Fonts

Java has a variety of fonts that can be used whenever text is printed.

```
Font MyFont = new Font("Times New Roman", Font.BOLD, 12);  
JButton jb = new JButton("Press Me");  
jb.setFont(MyFont);
```

PLAIN, BOLD, ITALIC, BOLD | ITALIC
Various sizes
Show ListFonts.java



Any last minute
requests?

Review Mandelbrot.java code

- Text extents, font, text color
- Image display
- Review JFrame, event handling